

Sea Ice Floe Size Distribution in the Beaufort Sea Measured by IRS-1 SAR

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Model results indicate that understanding summer heat balance and freshwater balance in the polar oceans requires knowledge of how much goes into vertical and lateral sea ice melt. In addition to thickness, two of the key ice parameters that affect melt rate are ice concentration and floe size. Smaller ice floes and more open water enables more heat to go into lateral melt preferentially to vertical melt, thereby enhancing warming up the upper ocean and increasing stratification.

Using IRS-1 SAR imagery along two areas, one in the Beaufort Sea and another in the Chukchi Sea, floe size distributions were obtained during the summer period in 1992. Floe size was derived using an algorithm developed at the University of Kansas. It is expected that floe sizes will generally decrease during the course of a summer's melt and due to storm and wave action. Comparisons will be made of floe distributions, together with meteorological and buoy measurements, to examine the differences between an ice sink region (Chukchi) and a multiyear ice region (Beaufort) in the summer melt process.